CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: December 23, 2021

TO: Sarah Donoughe – NER/Green Bay Service Center

FROM: Michael Polkinghorn – NOR/Rhinelander Service Center Michael Polkinghorn

SUBJECT: Water Quality-Based Effluent Limitations for the Waupaca Foundry, Inc. Plant No. 1
WPDES Permit No. WI-0026379-09-0

This is in response to your request for an evaluation of the need for water quality-based effluent limitations (WQBELs) using chapters NR 102, 104, 105, 106, 207, 210, 212, and 217 of the Wisconsin Administrative Code (where applicable), for the discharge from the Waupaca Foundry, Inc. Plant No. 1 in Waupaca County. This secondary industrial facility discharges to the Waupaca River, located in the Waupaca Watershed in the Wolf River Basin. This discharge is included in the Upper Fox/Wolf Rivers Basin (UFWRB) Total Maximum Daily Load (TMDL) as approved by EPA on 02/27/2020. The evaluation of the permit recommendations is discussed in more detail in the attached report.

Based on our review, the following recommendations are made on a chemical-specific basis at Outfall 001:

Parameter	Daily Maximum	Daily Minimum	Annual Total	Footnotes
Flow Rate				1
TSS			6,062 lbs/yr	2, 3
pH	9.0 s.u.	6.0 s.u.		4
Phosphorus			37 lbs/yr	2, 3
Chloride				5
Temperature				6

Footnotes:

1. Monitor each day whenever discharge occurs.
2. Also applicable to Outfall 002.
3. The total suspended solids (TSS) and phosphorus mass limits are based on the TMDL for the UFWRB to address TSS and phosphorus water quality impairments within the TMDL area.
4. No changes from the current permit.
5. Monitoring at a frequency to ensure that 11 samples are available at the next permit issuance.
6. Weekly monitoring for one year during the permit term is recommended to determine the need for limits at the next permit reissuance.

No WET testing is required because information related to the discharge indicates low to no risk for toxicity. Additional limits to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Codes, are not required due to the non-continuous nature of the discharge.

Please consult the attached report for details regarding the above recommendations. If there are any questions or comments, please contact Michael Polkinghorn at (715) 360-3379 or Michael.Polkinghorn@wisconsin.gov and Diane Figiel at Diane.Figiel@wisconsin.gov.

Attachments (2) – Narrative & discharge area map

PREPARED BY: Michael A. Polkinghorn, E.I.T. – Water Resources Engineer

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E-cc: Roy Van Gheem, Wastewater Engineer – NER/Green Bay Service Center
Heidi Schmitt-Marquez, Regional Wastewater Supervisor – NER/Green Bay Service Center
Diane Figiel, P.E., Water Resources Engineer – WY/3

Attachment #1

Water Quality-Based Effluent Limitations for
Waupaca Foundry, Inc. Plant No. 1

WPDES Permit No. WI-0026379-09-0

Prepared by: Michael A. Polkinghorn, E.I.T.

PART 1 – BACKGROUND INFORMATION

Facility Description

Waupaca Foundry Plant No.1 (Waupaca FP #1) produces gray iron castings using cupola iron melting and green sand molding process. All sanitary wastes are discharged to the Waupaca wastewater treatment facility. Noncontact cooling water (NCCW) consists of water used from production machinery and collected stormwater. This NCCW is discharged on a noncontinuous basis via Outfall 001 to the east bank of the Waupaca River, approximately 200 yards north of the Water St. Bridge.

Outfall 002 is for emergency discharge of NCCW at approximately 50 yards north of Outfall 001's location. In emergency situations such as pump failures or power outages, potable "once through" city water will be used for cooling the plant equipment by opening up the closed loop and allowing city water to cool the equipment in a once through fashion prior to being discharged via the stormwater pond and Outfall 002. While chemical additives are used within the closed loop system (two biocides and two corrosion inhibitors) when an emergency discharge occurs the first slug of the closed loop cooling water is diverted to the City of Waupaca wastewater treatment facility in lieu of through Outfall 002. Following this diversion, the remaining once through cooling water not containing additive will then flow out via Outfall 002. Waupaca Foundry has implemented these measures to prevent the discharge of closed loop treatment additives through Outfall 002.

Attachment #2 is the discharge area of Outfalls 001/002.

Existing Permit Limitations

The current permit, expiring on 03/31/2022, includes the following effluent limitations and monitoring requirements. Only flow monitoring is required for Outfall 002.

Parameter	Daily Maximum	Daily Minimum	Footnotes
Flow Rate			1
TSS			2
pH	9.0 s.u.	6.0 s.u.	3
Oil & Grease (Hexane)			2
Zinc (Total Recoverable)			4

Footnotes:

1. Quarterly monitoring.

2. Annual monitoring.
3. These limitations are not being evaluated as part of this review. Because the water quality criteria (WQC), reference effluent flow rates, and receiving water characteristics have not changed, limitations for these water quality characteristics do not need to be re-evaluated at this time.
4. Monthly monitoring during 1 year of the current permit term with an additional year of monitoring at the discretion of the permittee. Intake monitoring was recommended but not required.

Receiving Water Information

- Name: Waupaca River
- Waterbody Identification Code (WBIC): 257400
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: Warm Water Sport Fish (WWSF) community, non-public water supply. Cold Water and Public Water Supply criteria are used for bioaccumulating compounds of concern, because the discharge is within the Great Lakes basin.
- Low flows used in accordance with chs. NR 106 and 217, Wis. Adm. Code: The following 7-Q_{10} and 7-Q_2 values are from USGS for SE ¼, NW ¼, Section 29, T22N – R12E above the Crystal River in Waupaca WI, where Outfall 001 is located.

  7-Q_{10} = 77 cfs (cubic feet per second)

  7-Q_2 = 107 cfs

  Harmonic Mean Flow = 110 cfs using a drainage area of 157 mi^2.

  The Harmonic Mean has been estimated based on average flow and the 7-Q_{10} using an equation from U.S. EPA's *Technical Support Document for Water Quality-Based Toxics Control* (March 1991, EPA/505/2-90-001, pgs. 88-89).
- Hardness = 222 mg/L as $CaCO_3$. This value represents the geometric mean of data (n = 11) from WET testing performed for the Agropur Inc. Weyauwega Plant from March 2006 – January 2010.
- % of low flow used to calculate limits in accordance with s. NR 106.06(4)(c)5., Wis. Adm. Code: 25%.
- Source of background concentration data: Metals data from the Wolf River at New London, WI is used for this evaluation because there is no data available for the Waupaca River. The Wolf River is within the same ecological landscape so ambient water quality characteristics are expected to be similar. The numerical values are shown in the tables in Part 2 below, in the column titled "MEAN BACK-GRD.". If no data is available, the background concentration is assumed to be negligible and a value of zero is used in the computations.
- Multiple dischargers: The Waupaca wastewater treatment facility discharges to the Waupaca River approximately 0.8 mi downstream of Outfall 001. They are not in the immediate vicinity and the mixing zones do not overlap. Therefore, the other dischargers do not impact this evaluation.
- Impaired water status: There are no known impairments to Waupaca River. The Waupaca River is in the UFWRB TMDL area to address TSS and phosphorus impairments in the TMDL area.

Effluent Information

- Flow rate(s):

  Representative flow = 0.372 Million Gallons per Day (MGD)

  The Waupaca FP #1 is only required to report their flows on a quarterly basis and discharge more than what they report to the department. Emergency discharge from Outfall 002 has only occurred twice during the current permit term on 03/16/2019 and 08/02/2021 and has the potential to discharge simultaneously with Outfall 001. Because of these uncertainties the representative flow on any given

day will be the sum of the maximum recorded flows during the permit term. These are 0.189 MGD (08/23/2017) for Outfall 001 and 0.183 MGD (08/02/2021) for Outfall 002. The representative total flow is significantly lower than the total flow of 1.131 MGD determined in the January 2017 WQBEL memorandum where the facility stated in the permit application, they have implemented water conservation measures in their operations during the current permit term. For reference, the actual average of flows from both outfalls available to the department from April 2017 – August 2021 was 0.061 MGD.

- Hardness = 318 mg/L as $CaCO_3$. This value represents the geometric mean of data (n = 4) from the permit application required monitoring.
- Acute dilution factor used in accordance with s. NR 106.06(3)(c), Wis. Adm. Code: Not applicable – this facility does not have an approved zone of initial dilution (ZID).
- Water supply: City of Waupaca.
- Total Phosphorus Wasteload Allocation: 37 lbs/year, 0.1 lbs/day (See page 10 of Appendix H of the *Total Maximum Daily Loads for Total Phosphorus and Total Suspended Solids Upper Fox and Wolf Basins Report, February 27, 2020*).
- Total Suspended Solids Wasteload Allocation: 6,062 lbs/year, 17 lbs/day (See page 10 of Appendix I of the *Total Maximum Daily Loads for Total Phosphorus and Total Suspended Solids Upper Fox and Wolf Basins Report, February 27, 2020*).
- Additives: None used for Outfall 001. The waste stream for Outfall 002 uses two biocides and two corrosion inhibitors but the known volume containing the additives is discharged first to the Waupaca wastewater treatment facility for days of emergency discharge.
- Effluent characterization: This facility is categorized as a secondary industry, so the permit application required effluent sample analyses for a limited number of common pollutants, as specified in s. NR 200.065, Table 1, Wis. Adm. Code, primarily metal substances plus ammonia, chloride, hardness, phosphorus, temperature, and chlorine. Effluent data for Outfall 001 is considered to be representative of Outfall 002.
- Effluent data for substances for which a single sample was analyzed is shown in the tables in Part 2 below, in the column titled "MEAN EFFL. CONC.". Otherwise, substances with multiple effluent data are shown in the tables below or in their respective parts in this evaluation.

Copper Effluent Data

Sample Date	Copper µg/L
07/15/2021	7.3
07/22/2021	5.5
07/27/2021	2.7
08/03/2021	2.3
Mean	4.5

Zinc Effluent Data

Sample Date	Zinc µg/L
04/14/2020	15
05/05/2020	20
06/03/2020	22
07/08/2020	20

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Sample Date	Zinc µg/L
08/05/2020	17
09/02/2020	13
10/09/2020	11
11/11/2020	13
12/03/2020	15
01/05/2021	20
02/04/2021	13
03/04/2021	13
1-day P_{99}	26
4-day P_{99}	21

The following table presents the average concentrations and loadings at Outfall 001 from April 2017 – August 2021 for all parameters with limits in the current permit to meet the requirements of s. NR 201.03(6), Wis. Adm. Code:

Parameter Averages with Limits

	Average Measurement
pH field	7.36

*Results below the level of detection (LOD) were included as zeroes in calculation of average.

PART 2 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR TOXIC SUBSTANCES – EXCEPT AMMONIA NITROGEN

Permit limits for toxic substances are required whenever any of the following occur:

1. The maximum effluent concentration exceeds the calculated limit (s. NR 106.05(3), Wis. Adm. Code)
2. If 11 or more detected results are available in the effluent, the upper 99th percentile (or P_{99}) value exceeds the comparable calculated limit (s. NR 106.05(4), Wis. Adm. Code)
3. If fewer than 11 detected results are available, the mean effluent concentration exceeds 1/5 of the calculated limit (s. NR 106.05(6), Wis. Adm. Code)

Acute Limits based on 1-Q_{10}

Daily maximum effluent limitations for toxic substances are based on the acute toxicity criteria (ATC), listed in ch. NR 105, Wis. Adm. Code. Previously daily maximum limits for toxic substances were calculated as two times the ATC. However, changes to ch. NR 106, Wis. Adm. Code, (September 1, 2016) require the Department to calculate acute limitations using the same mass balance equation as used for other limits along with the 1-Q_{10} receiving water low flow to determine if more restrictive effluent limitations are needed to protect the receiving stream from discharges which may cause or contribute to an exceedance of the acute water quality standards. The mass balance equation is provided below.

$$\text{Limitation} = \frac{(WQC)\,(Qs + (1-f)\,Qe) - (Qs - f\,Qe)\,(Cs)}{Qe}$$

Where:

WQC =Acute toxicity criterion or secondary acute value according to ch. NR 105, Wis. Adm. Code.

Qs = average minimum 1-day flow which occurs once in 10 years (1-day Q_{10}) if the 1-day Q_{10} flow data is not available = 80% of the average minimum 7-day flow which occurs once in 10 years (7-day Q_{10}).

Qe = Effluent flow (in units of volume per unit time) as specified in s. NR 106.06(4)(d), Wis. Adm. Code.

f = Fraction of the effluent flow that is withdrawn from the receiving water, and

Cs = Background concentration of the substance (in units of mass per unit volume) as specified in s. NR 106.06(4)(e), Wis. Adm. Code.

If the receiving water is effluent dominated under low stream flow conditions, the 1-Q_{10} method of limit calculation produces the most stringent daily maximum limitations and should be used while making reasonable potential determinations. This is not the case for Waupaca FP #1 and the limits are set based on two times the acute toxicity criteria.

The following tables list the calculated WQBELs for this discharge along with the results of effluent sampling. All concentrations are expressed in terms of micrograms per Liter (µg/L), except for hardness and chloride (mg/L).

Daily Maximum Limits based on Acute Toxicity Criteria (ATC)

RECEIVING WATER FLOW = 62 cfs, (1-Q_{10} (estimated as 80% of 7-Q_{10})), as specified in s. NR 106.06(3)(bm), Wis. Adm. Code.

SUBSTANCE	REF. HARD.* mg/L	ATC	MAX. EFFL. LIMIT**	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	1-day P_{99}	1-day MAX. CONC.
Chlorine		19.0	38.1	7.6	0.0		0.0
Arsenic		340	680	136	1.2		1.2
Cadmium	318	38.8	77.6	15.5	0.19		0.19
Chromium	301	4,446	8,892	1,778	1.4		1.4
Copper	318	46.2	92.4	18.5	4.5		7.3
Lead	318	327	653	131	4.3		4.3
Nickel	268	1,080	2,161	432	3.5		3.5
Zinc	318	331	662			26	22
Chloride (mg/L)		757	1,514	303	280		280

* The indicated hardness may differ from the effluent hardness because the effluent hardness exceeded the maximum range in ch. NR 105, Wis. Adm. Code, over which the acute criteria are applicable. In that case, the maximum of the range is used to calculate the criterion.

* * The 2 × ATC method of limit calculation yields a more restrictive limit than consideration of ambient concentrations and 1-Q_{10} flow rates per the changes to s. NR 106.07(3), Wis. Adm. Code, effective 09/01/2016.

Weekly Average Limits based on Chronic Toxicity Criteria (CTC)

RECEIVING WATER FLOW = 19 cfs (¼ of the 7-Q_{10}), as specified in s. NR 106.06(4)(c), Wis. Adm. Code

SUBSTANCE	REF. HARD.* mg/L	CTC	MEAN BACK-GRD.	WEEKLY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	4-day P_{99}
Chlorine		7.28		251	50	0.0	
Arsenic		152.2		5,242	1,049	1.2	

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SUBSTANCE	REF. HARD.* mg/L	CTC	MEAN BACK-GRD.	WEEKLY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	4-day P_{99}
Cadmium	175	3.82	0.133	127	25.4	0.19	
Chromium	222	254	0.704	8,718	1,743	1.4	
Copper	222	20.48	1.06	670	134	4.5	
Lead	222	60.5	0.247	2,076	415	4.3	
Nickel	222	102.45		3,529	706	3.5	
Zinc	222	241.72	1.8	8,266	1,653		21
Chloride (mg/L)		395	15	13,104	2,621	280	

* The indicated hardness may differ from the receiving water hardness because the receiving water hardness exceeded the maximum range in ch. NR 105, Wis. Adm. Code, over which the chronic criteria are applicable. In that case, the maximum of the range is used to calculate the criterion.

Monthly Average Limits based on Wildlife Criteria (WC)
The effluent characterization did not include any effluent sampling results for substances for which WC exist.

Monthly Average Limits based on Human Threshold Criteria (HTC)
RECEIVING WATER FLOW = 28 cfs (¼ of Harmonic Mean), as specified in s. NR 106.06(4), Wis. Adm. Code.

SUBSTANCE	HTC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Cadmium	370	0.133	18,104	3,621	0.19
Chromium	3,818,000	0.704	186,877,606	37,375,521	1.4
Lead	140	0.247	6,841	1,368	4.3
Nickel	43,000		2,104,698	420,940	3.5

Monthly Average Limits based on Human Cancer Criteria (HCC)
RECEIVING WATER FLOW = 28 cfs (¼ of Harmonic Mean), as specified in s. NR 106.06(4), Wis. Adm. Code.

SUBSTANCE	HCC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Arsenic	13.3		651	130	1.2

In addition to evaluating the need for limits for each individual substance for which HCC exist, s. NR 106.06(8), Wis. Adm. Code, requires the evaluation of the cumulative cancer risk. Because no effluent limits are needed based on HCC, determination of the cumulative cancer risk is not needed per s. NR 106.06(8), Wis. Adm. Code.

Conclusions and Recommendations
Based on a comparison of the effluent data and calculated effluent limitations, **effluent limitations are not recommended for any toxic substances.** The need for ammonia nitrogen limits is evaluated in Part 3 of this evaluation. Monitoring recommendations are made in the following paragraphs:

Chloride – Considering available effluent data from the current permit term (07/22/2021), the mean effluent concentration is 280 mg/L. This effluent concentration is below the calculated WQBELs for

chloride; therefore, no effluent limits are needed. **Chloride monitoring is recommended to ensure that 11 sample results are available at the next permit issuance to meet the data requirements of s. NR 106.85, Wis. Adm. Code.**

PART 3 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR AMMONIA NITROGEN

The State of Wisconsin promulgated revised water quality standards for ammonia nitrogen in ch. NR 105, Wis. Adm. Code, effective March 1, 2004 which includes criteria based on both acute and chronic toxicity to aquatic life. Given the fact that the Waupaca FP #1 does not currently have ammonia nitrogen limits, the need for limits is evaluated at this time.

Effluent Data
Four samples for ammonia nitrogen were taken from July 2021 – August 2021, and their results were as follows:

Ammonia Nitrogen Effluent Data

Sample Date	Ammonia Nitrogen mg/L
07/15/2021	0.040
07/22/2021	0.86
07/27/2021	0.042
08/03/2021	0.040
Mean	0.25

*Values lower than the level of detection were substituted with a zero

Based on the effluent data above, these concentrations do not have the reasonable potential to exceed any calculated ammonia nitrogen limit. **Therefore, limits or monitoring for ammonia nitrogen are not recommended during the reissued permit term.**

PART 4 – PHOSPHORUS & TSS

Technology-Based Effluent Limit (TBEL) – Phosphorus
Subchapter II of Chapter NR 217, Wis. Adm. Code, requires industrial treatment facilities that discharge greater than 60 pounds of Total Phosphorus per month to comply with a monthly average limit of 1.0 mg/L expressed as a 12-month rolling average, or an approved alternative concentration limit.

Because Waupaca FP #1 does not currently have an existing technology-based limit, the need for this limit in the reissued permit is evaluated. The facility has submitted phosphorus effluent data from July 2021 – September 2021 with 0.060 mg/L being the highest value. Assuming the facility discharges the maximum daily flow of 0.372 MGD every day for a month, the total volume discharged is 11.5 MG/month. Therefore, the maximum total mass phosphorus discharged in any given month is 0.060 mg/L × 11.5 MG/month × 8.34 (conversion factor) = 5.8 lbs/month. This loading is less than 60 lbs/month, which is the threshold for industrial facilities in accordance to s. NR 217.04(1)(a)2, Wis. Adm. **Therefore, a technology-based limit is not recommended during the reissued permit term.** In addition, the need for a WQBEL for phosphorus must be considered.

TMDL Limits – Phosphorus
Total phosphorus (TP) effluent limits in lbs/day are calculated as recommended in the *TMDL Development and Implementation Guidance: Integrating the WPDES and Impaired Waters Programs (*April 2020) and are based on the annual phosphorus wasteload allocation (WLA) given in pounds per year. This WLA found in Appendix H of the *Total Maximum Daily Loads for Total Phosphorus and Total Suspended Solids in the Upper Fox and Wolf River Basins (UFWRB TMDL)* report dated February 2020 are expressed as maximum annual loads (lbs/year). For Waupaca FP #1, these phosphorus WLAs are 37 lbs/yr and 0.1 lbs/day.

For the reasons explained in the April 30, 2012 paper entitled *Justification for Use of Monthly, Growing Season and Annual Average Periods for Expression of WPDES Permit Limits for Phosphorus Discharges in Wisconsin*, WDNR has determined that the phosphorus WQBELs set equal to WLAs would not be consistent with the assumptions and requirements of the TMDL. Therefore, limits given to facilities included in the Upper Fox and Wolf River Basins TMDL are given monthly average mass limits and, if the equivalent effluent concentration is less than or equal to 0.3 mg/L, six-month average mass limits are also included. The exception is for noncontinuous dischargers the WLA may be expressed directly as an annual total. Because Waupaca FP #1 is a noncontinuous discharger, phosphorus limits will be set equal to the WLA as a maximum annual total during time periods when the discharge occurs. **Therefore, the annual total limit of 37 lbs/yr is recommended during the reissued permit term and is applicable to both outfalls.**

The UFWRB TMDL establishes TP wasteload allocations to reduce the loading in the entire watershed including WLAs to meet water quality standards for tributaries to the Upper Fox and Wolf River. Therefore, WLA-based WQBELs are protective of immediate receiving waters and TP WQBELs derived according to s. NR 217.13, Wis. Adm. Code are not required.

Since wasteload allocations are expressed as annual loads (lbs/yr), permits with TMDL-derived monthly average permit limits should require the permittee to calculate and report rolling 12-month sums of total monthly loads for TP. Rolling 12-month sums can be compared directly to the annual wasteload allocation.

The following table lists the statistics for effluent phosphorus levels from July 2021 – September 2021 for informational purposes.

Phosphorus Effluent Data

Sample Date	mg/L
07/15/2021	0.031
07/22/2021	0.060
07/27/2021	0.022
08/03/2021	0.022
08/10/2021	0.037
08/16/2021	0.032
08/24/2021	0.035
08/31/2021	0.029
09/09/2021	0.040
09/14/2021	0.025
09/22/2021	0.048

09/28/2021	0.030
1-day P_{99}	0.068
4-day P_{99}	0.049
30-day P_{99}	0.039
Mean	0.034
Std	0.011
Sample Size	12
Range	0.022 - 0.06

TMDL Limits – TSS

Total Suspended Solids (TSS) effluent limits in lbs/day are calculated as recommended in the *TMDL Development and Implementation Guidance: Integrating the WPDES and Impaired Waters Programs (*April 2020). This WLAs found in Appendix I of the *Total Maximum Daily Loads for Total Phosphorus and Total Suspended Solids in the Upper Fox and Wolf Basins (UFW TMDL)* report dated February 2020 are expressed as maximum annual loads (lbs/year). For Waupaca FP #1, these TSS WLAs are 6,062 lbs/yr and 17 lbs/day.

Revisions to chs. NR 106 and 205, Wis. Adm. Code align Wisconsin water quality-based effluent limits with 40 CFR 122.45(d), which requires WPDES permits to contain the following concentration limits, whenever practicable and necessary to protect water quality:

- Weekly average and monthly average limitations for continuous discharges subject to ch. NR 210.
- Daily maximum and monthly average limitations for all other discharges.

Waupaca FP #1 is a noncontinuous discharger and is not subject to the above requirements. Similar to the phosphorus WLA, the TSS WLA may be expressed directly as an annual total. Because Waupaca FP #1 is a noncontinuous discharger, TSS limits will be set equal to the WLA as a maximum annual total during time periods when the discharge occurs. **Therefore, the annual total limit of 6,062 lbs/yr is recommended during the reissued permit term and is applicable to both outfalls.**

Since wasteload allocations are expressed as annual loads (lbs/yr), permits with TMDL-derived monthly average permit limits should require the permittee to calculate and report rolling 12-month sums of total monthly loads for TSS. Rolling 12-month sums can be compared directly to the annual wasteload allocation.

The following table lists the statistics for effluent TSS levels from July 2021 – September 2021 for informational purposes.

TSS Effluent Data

Sample Date	mg/L
10/25/2017	2.0
12/18/2018	2.3
12/04/2019	2.0
12/15/2020	<1.8
08/24/2021	6.7
Mean	2.6

PART 5 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR THERMAL

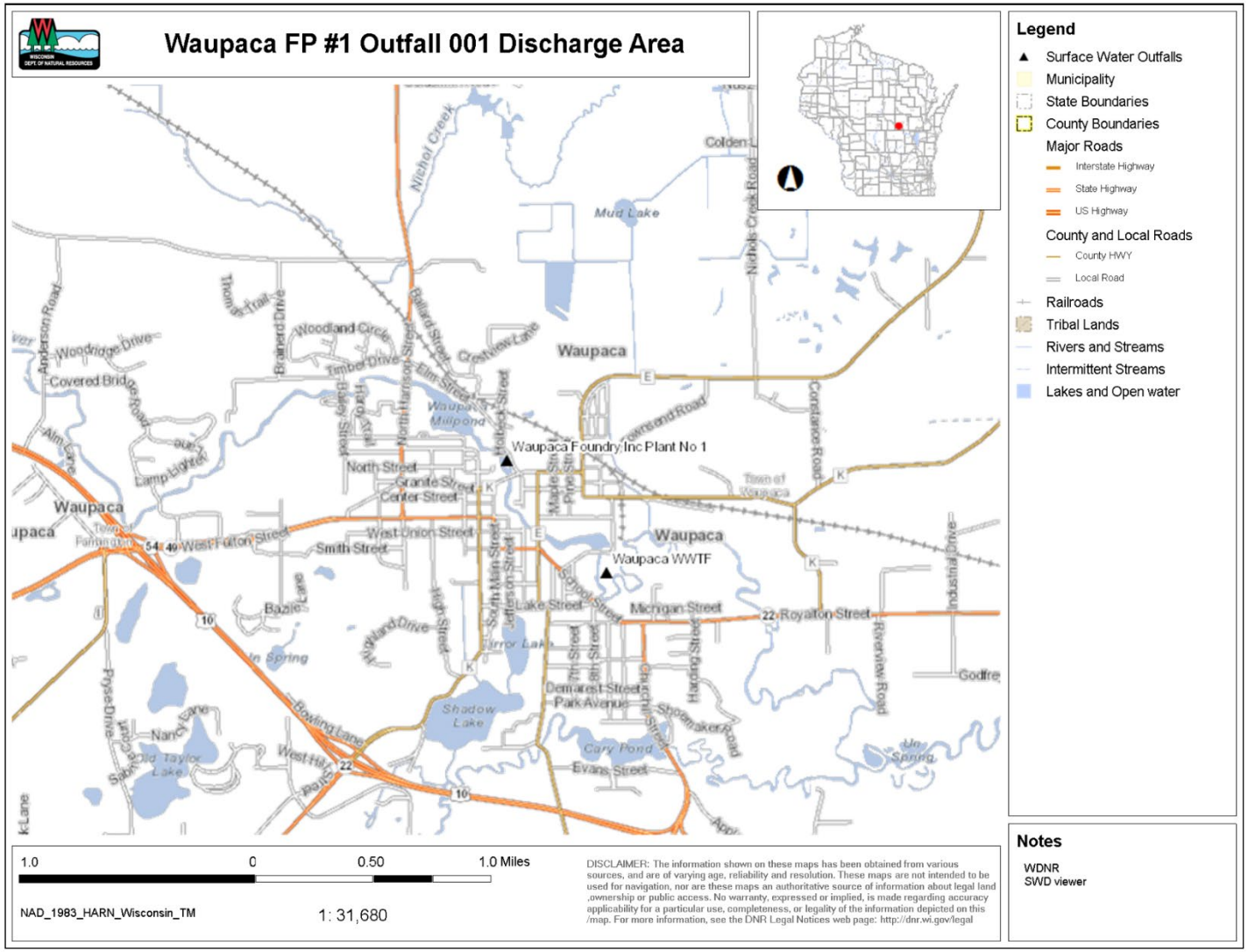
Surface water quality standards for temperature took effect on October 1, 2010. These regulations are detailed in chs. NR 102 (Subchapter II – Water Quality Standards for Temperature) and NR 106 (Subchapter V – Effluent Limitations for Temperature) of the Wisconsin Administrative Code. Daily maximum and weekly average temperature criteria are available for the 12 different months of the year depending on the receiving water classification.

Due to the amount of upstream flow available for dilution in the limit calculation (Qs:Qe >20:1), the lowest calculated limitation is 120° F (s. NR 106.55(6)(a), Wis. Adm. Code). The permit application required sample for Outfall 001 is 75.4 ºF (08/30/2021) and is significantly less than the daily maximum limit. This discharge is not expected to exceed the daily maximum limit for the other 11 months during the year assuming effluent data similar to August. **Therefore, temperature limits are not recommended during the reissued permit term. Weekly temperature monitoring for one year during the permit term is recommended to determine the need for temperature limits at the next permit reissuance.**

PART 6 – WHOLE EFFLUENT TOXICITY (WET)

WET testing is used to measure, predict, and control the discharge of toxic materials that may be harmful to aquatic life. In WET tests, organisms are exposed to a series of effluent concentrations for a given time and effects are recorded. Decisions below related to the selection of representative data and the need for WET limits were made according to ss. NR 106.08 and 106.09, Wis. Adm. Code. WET monitoring frequency and toxicity reduction evaluation (TRE) recommendations were made using the best professional judgment of staff familiar with the discharge after consideration of the guidance in the *Whole Effluent Toxicity (WET) Program Guidance Document (October 29, 2019).*

Outfalls 001 and 002 are comprised primarily of NCCW and stormwater. In addition, the waste stream for Outfall 002 uses two biocides and two corrosion inhibitors but the known volume containing the additives is discharged first to the Waupaca wastewater treatment facility for days of emergency discharge. Neither discharge have a history of WET failures and no toxic compounds are expected at levels of concern. **Since there is believed to be a very low risk of toxicity, WET testing is not recommended during the reissued permit term.**


Waupaca FP #1 Outfall 001 Discharge Area
Legend
Surface Water Outfalls
Municipality
State Boundaries
County Boundaries
Major Roads
Interstate Highway
State Highway
US Highway
County and Local Roads
County HWY
Local Road
Railroads
Tribal Lands
Rivers and Streams
Intermittent Streams
Lakes and Open water
Waupaca Foundry Inc Plant No 1
Waupaca WWTF
Waupaca
Mud Lake
Shadow Lake
Cary Pond
Mirror Lake
Nichol Creek
Nichols Creek Road
Ballard Street
Crestview Lane
Woodland Circle
Timber Drive
Elm Street
North Harrison Street
Waupaca Millpond
Hatfield Street
North Street
Granite Street
Center Street
West Union Street
Smith Street
West Fulton Street
South Main Street
Jefferson Street
Lake Street
Michigan Street
Royalton Street
Constance Road
Riverview Road
Demarest Street
Park Avenue
Evans Street
Bowling Lane
Nancy Lane
Old Taylor Lake
Bazile Lane
Highland Drive
Anderson Road
Woodridge Drive
Covered Bridge Road
Lamp Lighter Lane
Alm Lane
Rose Drive
Spokemaker Road
Godfre
Notes
WDNR
SWD viewer
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NAD_1983_HARN_Wisconsin_TM
1: 31,680
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